

## TEACHER GUIDE

### Lesson 1: Introduction to Plankton

**Time Required:** 40 minutes. Advance preparation requires an additional 15 minutes.

**Structure:** In this lesson, students first develop the requisite background knowledge on plankton through a short PowerPoint presentation (10 minutes). Students then investigate and identify various phytoplankton using images that were previously taken with a compound microscope (25 minutes). We recommend students work in small groups. Materials are provided for five groups. A combined pre- and post- survey for Lessons 1, 2, and 3 is included. The pre-survey is given at the beginning of Lesson 1 (5 minutes) and the post-survey is given at the end of Lesson 3.

**Materials:** (Paper materials contained in binder are shown in **BOLD CAPS**)

*Materials are provided for 5 groups. We suggest 4–6 students per group.*

1. CD with narrated PowerPoint Presentation
2. Speakers
3. **PLANKTON SURVEY – Lessons 1, 2, and 3: Version 1** (geared towards elementary school standards)
4. **TEACHER ANSWER KEY to PLANKTON SURVEY – Lessons 1, 2, and 3: Version 1**
5. **PLANKTON SURVEY – Lessons 1, 2, and 3: Version 2** (geared towards middle school standards)
6. **TEACHER ANSWER KEY to PLANKTON SURVEY – Lessons 1, 2, and 3: Version 2**
7. **POWERPOINT SCRIPT**
8. **STUDENT WORKSHEET – POWERPOINT – Lesson 1: Introduction to Plankton**
9. **TEACHER ANSWER KEY to STUDENT WORKSHEET – POWERPOINT – Lesson 1: Introduction to Plankton**
10. **STUDENT WORKSHEET – Lesson 1: Phytoplankton Microscopy Lab**
11. **SLIDES – Lesson 1: Phytoplankton Microscopy Lab** (5 in Inner Box)
12. **ANSWER KEY – Lesson 1: Phytoplankton Microscopy Lab**
13. **PHYTOPLANKTON ID GUIDE – Lesson 1: Phytoplankton Microscopy Lab** (10 in Inner Box)
14. **GLOSSARY**
15. *The Invisible ABCs* reference book (elementary school level)
16. Sea Soup reference books (middle to high school level)
  - *Sea Soup Phytoplankton, Sea Soup Zooplankton, and Sea Soup Teacher's Guide*
17. Giant Microbes (5)
  - Krill, Red Tide, Sea Sparkle, Algae, and T4 Virus

**Materials Not Included in this Kit but Needed for Lesson 1:**

18. Projector

#### **Advance Preparation:**

1. A short (10 minute), narrated PowerPoint entitled *Introduction to Plankton* can be found on the CD located in the binder. This PowerPoint presentation is preloaded on the computer in the microscope box. If you prefer to use your own computer, load the PowerPoint presentation by dragging the file from the CD onto the computer desktop. Eject the CD and return it to the binder.
2. Speakers are included in the kit for playing the narrated presentation. Refer to the laminated manual attached to the speaker storage case for set-up instructions.
3. If you prefer to present the information yourself, load the non-narrated version of the PowerPoint presentation. A **POWERPOINT SCRIPT** is included as a guide.
4. Photocopy or print the **PLANKTON SURVEY – Lessons 1, 2, and 3** version that is appropriate for your students (one per student). This is given as a pre-survey at the beginning of this lesson. It will also be given as a post-survey at the end of Lesson 3.
5. A **GLOSSARY** is provided for Lesson 3, but may also be helpful for Lesson 1. Photocopy or print the **GLOSSARY** (one per student) if desired.

### Instructional Procedures:

1. Pass out the **PLANKTON SURVEY – Lessons 1, 2, and 3** (one per student). Have students check the pre-survey box and answer the questions (allow 5 minutes). After Lesson 3 is completed, the students will answer these same questions as a post-survey. A **TEACHER ANSWER KEY** is provided for your convenience.
2. Distribute a **STUDENT WORKSHEET – PowerPoint – Lesson 1: Introduction to Plankton** to each student. Play the narrated PowerPoint presentation to familiarize your students with marine plankton.
3. Review the main topics of the PowerPoint presentation with your students: phytoplankton are plant-like and have certain adaptations for survival; zooplankton are animal-like and can exist as meroplankton or holoplankton; and plankton form the basis of the marine food web. Go over the answers to the student worksheet.
4. Distribute a **STUDENT WORKSHEET – Lesson 1: Phytoplankton Microscopy Lab** to each student.
5. Divide the students into five groups. Distribute one copy of **SLIDES – Lesson 1: Phytoplankton Microscopy Lab** and two copies of **PHYTOPLANKTON ID GUIDE – Lesson 1: Phytoplankton Microscopy Lab** to each group.
6. Tell your students that they will be completing a phytoplankton microscopy lab. Explain that the **SLIDES – Lesson 1: Phytoplankton Microscopy Lab** are phytoplankton images that were taken with a compound microscope. Compound microscopes have very high magnification, which is essential to view these tiny phytoplankton. In Lesson 2, dissecting microscopes (which have lower magnification) suffice to study the larger zooplankton. After a quick introduction to the phytoplankton lab, students should be able to work independently in their groups.
7. Have students use the **PHYTOPLANKTON ID GUIDE – Lesson 1: Phytoplankton Microscopy Lab** to identify the marine phytoplankton that are found on the various photomicrographs (microscope images) provided in the **SLIDES – Lesson 1: Phytoplankton Microscopy Lab**.
8. Have the students draw the phytoplankton on their **STUDENT WORKSHEET – Lesson 1: Phytoplankton Microscopy Lab**.
9. When students are finished, have them check their answers using the **ANSWER KEY – Lesson 1: Phytoplankton Microscopy Lab**. (*Note: For each slide, only one of each type of phytoplankton is identified on the answer key.*)
10. Encourage the students to check out the Giant Microbe plush toys and the reference books when they are finished with the lab. Mention that the size of the plush toys is much larger than actual size. The tag on each plush toy gives its magnification.

### Assessment and Clean-up:

1. Have students return the **SLIDES – Lesson 1: Phytoplankton Microscopy Lab** and the **PHYTOPLANKTON ID GUIDE – Lesson 1: Phytoplankton Microscopy Lab**.
2. Disconnect the speakers and place them back into the science kit container.
3. Eject the CD with the PowerPoint presentation (if you have not already), and put it back into the binder.
4. If you plan to complete additional lessons from this kit, please do not have students complete the post-survey (this will be done after Lesson 3) and do not complete the **TEACHER EVALUATION** at this time.

## 5. If you are not completing additional lessons:

- Please have students complete the post-survey (you will need to make one additional photocopy per student). As the students are completing the post-survey, we would be grateful if you would complete the **TEACHER EVALUATION** of this kit. All comments, corrections, and suggestions are very welcome. If you prefer, you can complete the evaluation online (see **TEACHER EVALUATION** for website address).
- Re-pack the kit. Double check that all the items are included and in their proper place by completing the **SUPPLY CHECKLIST**. Please make a note of missing, broken, or damaged items so that they can be replaced. Please pack the kit so that the materials are stored as they were when you received them.

*Mahalo!*